

1        **CLAIMS**

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3        1.     A method, comprising:

4                communicatively coupling a set-top box with a hub of a media network,  
5        wherein the set-top box receives streaming Moving Picture Experts Group video  
6        modulated on coaxial cable rather than over an Internet protocol-based local area  
7        network;

8                filtering signals received by the media network to provide one or more  
9        available frequencies for communication between the set-top box and the hub;

10               tuning the set-top box to send data to the hub on an out-of-band channel;  
11        and

12               tuning the set-top box to receive data from the hub on an in-band channel.

13  
14        2.     The method as recited in claim 1, further comprising tuning the set-  
15        top box to receive multimedia content from the hub on the in-band channel.

16  
17        3.     The method as recited in claim 1, further comprising  
18        communicatively coupling the set-top box with a programming content source in  
19        addition to communicatively coupling the set-top box with the hub.

20  
21        4.     The method as recited in claim 3, wherein the programming content  
22        source is a headend.

1           5. The method as recited in claim 3, wherein the communicative  
2 coupling further includes connecting coaxial cable between the set-top box and the  
3 hub.

4  
5           6. The method as recited in claim 1, further comprising  
6 communicatively coupling media network nodes with the hub, wherein a media  
7 network node receives streaming Moving Picture Experts Group video over an  
8 Internet protocol-based local area network.

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10          7. The method as recited in claim 6, wherein the communicatively  
11 coupling media network nodes further includes communicatively coupling the  
12 media network nodes to the hub with Internet protocol-based local area network  
13 cable while coupling the set-top box to the hub with coaxial cable.

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15          8. The method as recited in claim 7, further comprising simultaneously  
16 sending communications and content between the hub and a media network node  
17 using Internet Protocol-based local area network communications while sending  
18 communications and content between the hub and the set-top box using the out-of-  
19 band and the in-band channels.

20  
21          9. The method as recited in claim 1, further comprising encrypting  
22 programming content to be sent from the hub to the set-top box.

23  
24          10. The method as recited in claim 9, further comprising sending  
25 multiple program streams each representing a different scrambled version of a

1 content, wherein the entire content can be derived from the multiple program  
2 streams using a key.

3  
4 11. The method as recited in claim 10, wherein for corresponding parts  
5 of each of the multiple program streams only one of the program streams has  
6 unscrambled content for that corresponding part.

7  
8 12. The method as recited in claim 11, wherein for corresponding parts  
9 of each of the multiple program streams a part of the key associated with the  
10 corresponding parts of each of the multiple program streams indicates which one  
11 program stream has the unscrambled content for that corresponding part.

12  
13 13. The method as recited in claim 12, wherein:  
14 the multiple program streams consist of two program streams,  
15 the key consists of a binary sequence, and  
16 each digit of the binary sequence distinguishes between the two program  
17 streams.

18  
19 14. A system, comprising:  
20 a computing hub for receiving and storing multimedia content;  
21 a set-top box coupled with the computing hub, wherein the set-top box  
22 receives streaming Moving Picture Experts Group video modulated on coaxial  
23 cable rather than over an Internet protocol-based local area network and wherein  
24 the set-top box sends data to the hub on an out-of-band channel and receives data  
25 from the hub on an in-band channel.

1  
2 15. The system as recited in claim 14, wherein the set-top box further  
3 receives multimedia content from the computing hub on the in-band channel.  
4

5 16. The system as recited in claim 15, wherein the set-top box is coupled  
6 with the hub and coupled with a multimedia content source in order to receive  
7 multimedia content directly from the multimedia content source.  
8

9 17. The system as recited in claim 16, wherein the multimedia content  
10 source is a headend.  
11

12 18. The system as recited in claim 16, wherein the hub is coupled with  
13 the multimedia content source.  
14

15 19. The system as recited in claim 16, wherein a radio frequency filter  
16 blocks one or more frequencies of a signal from the multimedia content source to  
17 the set-top box and to the hub.  
18

19 20. The system as recited in claim 19, wherein the set-top box sends data  
20 to the hub on an out-of-band channel that uses a frequency blocked by the radio  
21 frequency filter and receives data from the hub on an in-band channel that uses a  
22 frequency blocked by the radio frequency filter.  
23

24 21. The system as recited in claim 20, wherein the radio frequency filter  
25 blocks data sent on the out-of-band channel from being sent over a communicative

1 coupling to the multimedia content source and wherein the radio frequency filter  
2 blocks data sent on the in-band channel from being sent over the communicative  
3 coupling to the multimedia content source.

4  
5 22. The system as recited in claim 21, wherein the radio frequency filter  
6 prevents communications back and forth between the hub and the set-top box on  
7 the blocked frequencies from leaving the system.

8  
9 23. The system as recited in claim 14, wherein the set-top box is coupled  
10 with the computing hub, the computing hub is coupled with a multimedia content  
11 source, and the set-top box is not coupled directly with the multimedia content  
12 source.

13  
14 24. The system as recited in claim 14, further comprising media network  
15 nodes to control interactions between the computing hub and controllable  
16 multimedia devices, wherein the computing hub simultaneously communicates  
17 with the media network nodes over an Internet Protocol-based local area network  
18 and communicates with the set-top box over the out-of-band channel and the in-  
19 band channel.

20  
21 25. The system as recited in claim 24, wherein a physical connection  
22 between the computing hub and a media network node comprises an Ethernet  
23 cable and a physical connection between the computing hub and the set-top box  
24 comprises a coaxial cable.  
25

1           26. The system as recited in claim 14, further comprising a hub-side  
2 integration engine in the computing hub to facilitate communication with the set-  
3 top box.

4  
5           27. The system as recited in claim 26, wherein the hub-side integration  
6 engine further comprises an adapter to adapt upstream out-of-band data from the  
7 set-top box to the computing hub and to adapt downstream in-band data and  
8 multimedia content from the computing hub to the set-top box.

9  
10          28. The system as recited in claim 27, wherein the adapter tunes data  
11 from the set-top box to the out-of-band frequency for transmission to the  
12 computing hub and tunes data and multimedia content from the computing hub to  
13 the in-band frequency for transmission to the set-top box.

14  
15          29. The system as recited in claim 14, further comprising a content  
16 protector to encrypt multimedia content to be sent from the computing hub to the  
17 set-top box.

18  
19          30. The system as recited in claim 29, further comprising a content  
20 protection decrypter to decode encrypted content using a low processing power  
21 function of the set-top box.

22  
23          31. The system as recited in claim 30, wherein the computing hub sends  
24 multiple scrambled content streams and a key to the set-top box, wherein the set-  
25

1 top box uses the key to derive content from the multiple scrambled content  
2 streams.

3  
4 32. The system as recited in claim 30, wherein the computing hub sends  
5 two scrambled content streams and a binary sequence key to the set-top box,  
6 wherein the set-top box uses the digits of the binary sequence key to distinguish  
7 which of the two scrambled program streams has current unscrambled content.

8  
9 33. An electronic filter, comprising:  
10 an incoming filter to produce a band of blocked frequencies in an incoming  
11 stream of multimedia signals, wherein the incoming filter blocks signals having  
12 one of the blocked frequencies from entering a media network from a multimedia  
13 headend; and

14 an outgoing filter to block signals that originate in the media network and  
15 have one of the blocked frequencies from leaving the media network.

16  
17 34. The electronic filter as recited in claim 33, wherein one radio  
18 frequency filter is both the incoming filter and the outgoing filter.

19  
20 35. An adapter, comprising:  
21 a tuner to tune an out-of-band channel of a set-top box to a frequency  
22 selected for communication over a media network, wherein the media network has  
23 a hub that communicates over an Internet Protocol-based local area network with  
24 one or more network media nodes and communicates over the out-of-band channel  
25 and the in-band channel with the set-top box and one or more other set-top boxes;

1 a quadrature phase shift keying (QPSK) demodulator coupled with the  
2 tuner to demodulate upstream data signals from the tuner to the hub;

3 a quadrature amplitude modulation (QAM) modulator to receive and  
4 modulate data and multimedia content from the hub; and

5 an upconverter coupled with the quadrature amplitude modulation (QAM)  
6 modulator to upconvert modulated data and multimedia content signals to the set-  
7 top box.

8  
9 36. The adapter as recited in claim 35, wherein the QAM modulator  
10 comprises an Annex B type.

11  
12 37. The adapter as recited in claim 35, further comprising a QPSK  
13 modulator/demodulator coupled with the tuner to perform two-way data  
14 communication between the set-top box and the hub.

15  
16 38. The adapter as recited in claim 37, further comprising a Moving  
17 Picture Experts Group (MPEG) decoder and a National Television System  
18 Committee (NTSC) video standard encoder to receive video content from the hub  
19 and a radio frequency modulator coupled with the MPEG decoder/NTSC encoder  
20 to modulate video content signals for the set-top box.

21  
22 39. The adapter as recited in claim 35, wherein the set-top box sends  
23 data to the hub using an ALOHA protocol.

24  
25 40. A content protection system, comprising:



1 a content protector to create multiple scrambled program streams from a  
2 single program stream according to a key, and

3 a content decrypter to receive the multiple scrambled program streams and  
4 the key and decode the multiple scrambled program streams into a single program  
5 stream according to the key.

6  
7 41. The content protection system as recited in claim 40, wherein:

8 the content protector places an unscrambled video frame of program  
9 content in any one of the scrambled program streams and places an associated  
10 scrambled video frame of program content in each of the remaining multiple  
11 scrambled program streams, and

12 the identity of the scrambled program stream receiving the unscrambled  
13 video frame is recorded as a corresponding part of the key.

14  
15 42. The content protection system as recited in claim 41, wherein after  
16 receiving the multiple scrambled program streams and the key:

17 the content decrypter reads the key to determine for a current part of the  
18 program stream which of the multiple scrambled program streams has the current  
19 unscrambled video frame of program content.

20  
21 43. The content protection system as recited in claim 42, wherein sets of  
22 consecutive unscrambled video frames and corresponding sets of consecutive  
23 scrambled video frames are placed in the multiple scrambled program streams and  
24 the key is read at regular time intervals to determine which scrambled program  
25 stream has the next set of unscrambled video frames.

1  
2 44. The content protection system as recited in claim 43, wherein the  
3 key is read every one-half second.  
4

5 45. The content protection system as recited in claim 40, further  
6 comprising a key generator in the content protector, wherein the key generator  
7 makes keys of a selected length.  
8

9 46. The content protection system as recited in claim 45, wherein the  
10 content decrypter changes keys at regular time intervals.  
11

12 47. The content protection system as recited in claim 46, wherein the  
13 content decrypter changes keys every ten seconds.  
14

15 48. The content protection system as recited in claim 40, wherein the  
16 content protector encrypts the key according to a strong encryption technique and  
17 the content decrypted decodes a received key.  
18

19 49. The content protection system as recited in claim 40, wherein the  
20 content protector streams one continuous key to the content decrypter.  
21

22 50. A method of using a media network having a hub to send  
23 multimedia content to media network nodes and to set-top boxes in the media  
24 network, wherein the set-top boxes receive streaming Moving Picture Experts  
25

1 Group video modulated on coaxial cable rather than over an Internet protocol-  
2 based local area network, comprising:

3 tuning the set-top boxes to selected frequencies reserved for  
4 communication in the media network;

5 requesting a list of programs from the hub on an out-of-band channel of a  
6 set-top box using one of the selected frequencies;

7 receiving a list of programs from the hub on an in-band channel of the set-  
8 top box using one of the selected frequencies;

9 requesting program content on the out-of-band channel of the set-top box  
10 using one of the selected frequencies;

11 receiving a confirmation of the requesting program content on the in-band  
12 channel of the set-top box using one of the selected frequencies; and

13 receiving the program content on the in-band channel of the set-top box  
14 using one of the selected frequencies.

15  
16 51. A method of using a media network having a hub to send  
17 multimedia content to media network nodes and to set-top boxes in the media  
18 network, comprising:

19 tuning the set-top boxes to selected frequencies reserved for  
20 communication in the media network;

21 requesting a trick mode on an out-of-band channel of a set-top box using  
22 one of the selected frequencies;

23 receiving a confirmation of the requesting a trick mode on the in-band  
24 channel of the set-top box using one of the selected frequencies; and  
25

1 receiving the program content in the trick mode on the in-band channel of  
2 the set-top box using one of the selected frequencies.

3  
4 52. One or more computer readable media containing instructions that  
5 are executable by a computer to perform actions comprising:

6 filtering signals received by the media network to provide one or more clear  
7 frequencies for communicating between a set-top box and a hub of a media  
8 network;

9 tuning the set-top box to send data to the hub on an out-of-band channel;  
10 and

11 tuning the set-top box to receive data from the hub on an in-band channel.  
12

13 53. The one or more computer readable media as recited in claim 52,  
14 further comprising tuning the set-top box to receive multimedia content from the  
15 hub on the in-band channel.

16  
17 54. The one or more computer readable media as recited in claim 52,  
18 further comprising tuning the set-top box to receive multimedia content from the  
19 hub on the in-band channel.

20  
21 55. The one or more computer readable media as recited in claim 52,  
22 further comprising simultaneously sending communications and content between  
23 the hub and a media network node of the media network using Internet Protocol-  
24 based local area network communications while sending communications and  
25

1 content between the hub and a set-top box using the out-of-band and the in-band  
2 channels.

3  
4 56. The one or more computer readable media as recited in claim 52,  
5 further comprising encrypting programming content to be sent from the hub to a  
6 conventional set-top box.

7  
8 57. The one or more computer readable media as recited in claim 56,  
9 further comprising sending multiple program streams each representing a different  
10 scrambled version of a content, wherein the entire content can be derived from the  
11 multiple program streams using a key.